THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Barfai et al.	Confirmation No.:	4463
Serial No.:	10/028,525	Group Art Unit:	2113
Filed:	Oct. 25, 2001	Examiner:	Joseph D. Manoskey
Title:	Critical Adapter Local Error Handling		

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on January 23, 2006.

Jill K. Becker

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Date of Signature: January 23, 2006.

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Declaration Under 37 CFR § 1.131

We the undersigned, Dawn Moyer, Robert Bartfai, John Doxtader and Leroy Lundin, declare the following to be true, to the best of our knowledge and recollection:

1. that we are the inventors of the subject invention disclosed and claimed in the above-identified patent application, except for Nick Rash another inventor who is deceased;

2. that we were employed by International Business Machines Corporation in New York at the time of the subject invention;

3. that the subject invention described in the above-mentioned application was conceived and reduced to practice in the United States prior to July 17, 2001;

4. that the subject invention was embodied in code that was based upon an approved component design document which was also supplied to an independent (within the International Business Machines Corporation organization) Functional Verification Test (FVT) group whose responsibility was to exercise the functionality specified in the component design document;

5. that the subject code embodying the subject invention was actually approved by the Functional Verification Test group prior to July 17, 2001, and then was also subsequently passed on to a separate System Test group whose responsibility it was to insure compatibility within the larger system environment and with other running unrelated code packages, all of this occurring before July 11, 2001;

6. that the subject code embodying the subject invention was "closed" by the System Test group prior to July 17, 2001, meaning that the subject code had completed all of the testing phases required by the International Business Machines Corporation;

7. that, in accordance with International Business Machines Corporation software release procedures, code is not released for general availability prior to full and complete testing by the System Test group;

8. that code embodying the subject invention was announced as being "generally available" (in accordance with the same meaning given that phrase in recitation #7 immediately above) before the end of the year 2000;

9. that included herewith is a copy of the above-mentioned component software design document that was used to implement the features of the subject invention;

10. that all files, functions and their associated functionality recited in the claim of the present application were designed, implemented and operative to support Feature #47587 and are documented in the approved component design document; and that the component design document contains the ioctl names and not the actual function and file names, which are left

up to the code developers. (For instance, **cadd_adapter_start** in file **start.c** is documented as **ioctl, ADAPTER_START.** The **ioctls** are used by the FSD (Fault Service Daemon) whereas direct function calls are used by the device driver. The **ioctl** is merely a wrapper for user space code to access the hardware but it calls the exact same functions.);

11. that, with respect to the first recited step of claim 1 (that is, "detecting a nonpermanent error condition, within an adapter connected to one of said nodes, from which recovery is possible from within the node connected to said adapter"), this step was implemented as follows: the detection of a potential error condition is identified via error class masks that correspond to each specific error interrupt register on the adapter. These masks classified which bits were treated as possible recoverable critical adapter errors. The FLIH (first level interrupt handler) and SLIH (second level interrupt handler) functions **cadd_intr** and **cadd_intr_offlvl** in file **cadd.intr.c** respectively on the affected node classified and responded to all hardware error interrupts generated by the adapter. Eventually this classification and HW error registers were passed along to the FSD (Fault Service daemon) for further actions;

12. that, with respect to the second recited step of claim 1 (that is, "suspending communications from within the node with the adapter affected by said error condition"), this step was implemented as follows: Communications are suspended from within the node via the suspension of all existing open windows and rejecting any new window opens on the adapter experiencing the critical adapter error condition. A **CSS_SUSPEND-WINDOW** event is posted to all registered window owners (HAL and IP (Hardware Abstraction Layer and Interface Protocol)) which leave the windows open, drop packets and return successfully on reads and writes. There is no explicit notification to the protocols (Application Program Interfaces - APIs) that the window resources are no longer available. This notification caused the protocols to terminate the running applications 100% of the time. The FLIH function **cadd_intr** in file **cadd_intr.c** used the **cadd_suspend_windows** function in file **caddJntr.c** to suspend communications within the node without termination of any running applications. HAL (Hardware Abstraction Layer) used function **_col_suspend_win** in file **cole** and IP used function **ifcl_suspend_window** in file **ifcl_cfg.c** to take appropriate actions on the posted suspend event from the FLIH;

13. that, with respect to the third recited step of claim I (that is, "disabling communication between said affected adapter and said switch so as to provide an indication to at least one other node in said network that communication with said affected adapter is at least temporarily suspended so as to effectively cause suspension of, but not termination of, applications running on said at least one other node in said network"), this step was implemented as follows: The SLIH (Second Level Interrupt Handler) for critical adapter errors on the affected node resets the affected adapter to clear up any possible hang conditions. Resetting the adapter resulted in disabling the link (link no longer timed) which in turn caused link sync failures to be raised to the FSD switch recovery code running on the Primary node (FSD central point of control). Switch recovery suspended thresholding of link sync errors for 10 seconds. After 10 seconds, switch recovery continued to count link syncs within a specific time period for thresholding purposes. If the recovery actions on the affected node did not re-enable the link within the 10 second recovery window, the FSD switch recovery on the primary node "thresholded" and fenced the affected adapter off the switch. This fence (adapter recovery failure path) released all window resources on the affected adapter which resulted in the termination of running applications using these resources. The SLIH disabled communications between the affected adapter and the primary FSD node via the function **cadd_adapter_reset** in file **reset.c**. The FSD switch recovery suspended thresholding and fenced the adapter upon meeting the link sync threshold via function **CS_Switch_error_recovery** in file **CSrecovery.c**. Resources were released via the existing FSD base function **cadd_adapterResourceRelease** in file **cadd_auth.c**.

14. that, with respect to the fourth recited step of claim 1 (that is, "performing recovery operations, at said affected node, to restore operation of said affected adapter, based on said detected error condition, said recovery including enablement of said disabled communication"), this step was implemented as follows: The FSD adapter function **fs_daemon_fsm_adapter_thread_main** in file **fsd_fsm_adapt.c** started the adapter which re-enabled the link via function **cadd_adapter_start** in file **start.c**.

15. that, with respect to the fifth recited step of claim 1 (that is, "resuming communication with said affected adapter upon enablement of said disabled communication"), this step was implemented as follows: The FSD resumed communication on the affected adapter after

successful recovery actions by resuming the suspended windows on the adapter via **cadd_resume_windows** in file **cadd_auth.c**.

16. that the functions, calls, files and processes described above are found in the included component design document, subject to the naming clarification set forth in Item No. 10 above.

17. that an examination of the records contained within a permanent file designated CMVC (Configuration Management Version Control) indicates that the subject feature was completely tested and approved by the FVT team prior to July 17, 2001 and that this record contains the following information:

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SECTION 1 DETAILS
-----------------------------------------------------------------
prefix          fd
name            47587
reference       35880
abstract        CSS_COLONY: new feature to support Colony adapter recovery.
duplicate
component       css.init_no

state           closed                          priority
target                                          age             372

addDate         1999/02/04 09:37:22             assignDate      1999/07/12
17:17:27
lastUpdate      2000/08/01 16:55:31             responseDate    1999/07/12
17:24:25
endDate         2000/08/01 16:55:31

ownerLogin      dawn
ownerName       Moyer, Dawn                     originLogin     dawn
ownerArea       84ta                            originName      Moyer, Dawn
                                                originArea      84ta
```

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made

are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Date

Dawn S. Moyer

1-19-06
Date

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Date

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